

REMARKS

Claims 5, 12 and 14 are all the claims pending in the application.

Claim 14 is rejected under 35 U.S.C. § 102(b) as being anticipated by Japanese reference 2595260 (JP '260).

Claims 5 and 12 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Japanese reference 2595260 ('260) and further in view of Japanese reference 11-257361 (JP '361).

Analysis of the Prior Art Rejections

The present invention provides a bearing apparatus of a sealing type which is capable of improving its sealing ability at a low cost, while having excellent assembling and disassembling abilities.

Claim 14 is directed to a sealing bearing apparatus, which includes, *inter alia*, an inner race; an outer race; rolling elements rotatably disposed between the inner race and the outer race; and a sealing device for sealing a space between the inner race and the outer race. The sealing device is dividable in an axial direction, and the sealing device includes: an outer race member; an inner race member encircled by the outer race and attached to the inner race; and a sealing member furnished between the inner member and the outer member. The sealing member has a sealing body attached to the inner race member; and a sealing face part disposed on the outer race member, wherein, when the inner race member is rotated at a predetermined speed or lower, the sealing body contacts the sealing face part, and when the inner race member is rotated at a speed more than a predetermined speed, the sealing body reduces the contacting pressure to the

sealing face part, or separates from the sealing face part such as to form a non-contacting seal in conjunction with the sealing face part. The sealing body is positioned at a side of an interior space of the bearing with respect to the sealing face part.

With this structure, when disassembling the sealing members, as shown in Figures 14B and 15B, it is sufficient to separate the seal sliding member 922 from the outer race 913 together with the outer race holder 921, and since the sealing body is positioned at a side of an interior space of the bearing with respect to the sealing face part, disassembling can be easily carried out. (See paragraph [0102].)

JP '260 is a bearing device for train vehicle, which has an inner wheel 23, an outer wheel 21, a tapered roller 22, and a sealing device for sealing a space between the inner wheel and the outer wheel. When an axle 27 stops or rotates at a low speed, a free end 41b of a sealing member 41 contacts, owing to its elasticity, the outer circumference of a cylindrical portion 28c of a first metal ring 28 so as to avoid invasion of such as water from the outside. When the axle 27 rotates at a high speed, the sealing member 41 provided to the side of the rotating axle 27 rises at the free end 41b toward the outside in a radius owing to the centrifugal force, and expands the diameter, so that it does not contact the outer circumference of the cylindrical portion 28c.

However, the sealing device of JP '260 is not dividable in the axial direction as the present application. The sealing member 41 is provided to an attaching part 31a of a third metal ring 31, and the third metal ring 31 is fitted in a cylindrical portion 30b of the second metal ring 30. Further, the second metal ring 30 is fixedly held between the inner wheel 23 and a rear cover 26. The sealing device of JP '260 is not dividable in the axial direction because of the existence

of the rear cover 26. Therefore, the invention according to claim 14 is distinguishable from JP '260.

Claim 5 is directed to a sealing bearing apparatus which includes, *inter alia*, an inner race dividable in an axial direction; an outer race dividable in the axial direction; tapered rollers in four rows rotatably disposed between the inner race and the outer race; and a sealing device for sealing a space between the inner race and the outer race. The sealing device has an inner race member attached to the inner race and a sealing body attached to the inner race member, wherein when the inner race rotates at low speed, the sealing body serves as a contacting seal, and when the inner race rotates at high speed, the sealing body serves as a non-contacting seal or reduces a contacting pressure due to deformation thereof by a centrifugal force. The sealing device further includes: the outer race member; and the inner race member encircled by the outer race member, and the outer race member is defined with a circumferential groove in an outside edge thereof in the axial direction.

Claim 12 is directed to a sealing bearing apparatus, which includes, *inter alia*, an inner race an outer race rolling elements rotatably disposed between the inner race and the outer race; and a sealing device for sealing a space between the inner race and the outer race. The sealing device includes an outer race member; an inner race member encircled by the outer race and attached to the inner race; and a sealing member furnished between the inner member and the outer member. The sealing member has a sealing body attached to the inner race member; and a sealing face part disposed on the outer race member, wherein when the inner race member is rotated at a predetermined speed or lower, the sealing body contacts the sealing face part, and

when the inner race member is rotated at a speed more than a predetermined speed, the sealing body reduces the contacting pressure to the sealing face part, or separates from the sealing face part such as to form a non-contacting seal in conjunction with the sealing face part, wherein the outer race member is defined with a circumferential groove in an outside edge thereof in the axial direction.

As shown in Figure 17, by these structures, water content, which is about to enter the interior of the bearing along the outside edge in the axial direction of the outer race member, is trapped by the circumferential groove 1212b provided in the outside edge in the axial direction of the outer race member, and brought to the lowermost part of the groove following along the circumferential groove, and exhausted outside of the bearing therefrom.

As noted by the Examiner, JP '260 does not disclose the axially dividable sealing device or the circumferential groove in the outer race member.

JP '361 does not supplement these deficiencies of JP '260, and thus, the combination of JP '361 and JP '260 fails to render claims 5 and 12 obvious. Specifically, the O-ring of JP '361 is provided at the outside edge face in the radial direction of the bearing, and is formed with a groove for holding the O-ring therein also at the outside edge face in the radial direction. On the other hand, the grooves of claims 5 and 12 of this application are formed in the outside edge in the axial direction of the outer race member, and thus, are distinguishable from JP '361.

Conclusion

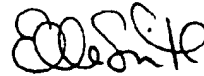
In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the

AMENDMENT UNDER 37 C.F.R. § 1.111
U.S. Appln. No. 10/632,832

Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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23373

CUSTOMER NUMBER

Date: April 6, 2005

Attorney Docket No.: Q76570



Appendix I

4/8

引例2 (特開平11-257361) は軸方向に分割可能な内輪4及び外輪2と、4列の円すいころ6と、密封装置8を有し、密封装置のシールホルダ9の外周面13に軸受ハウジングに対する密封性を確保するためのOリング14が取付けられている。
 しかしながら、引例2のOリングは軸受の径方向外側端面に設けられており、Oリングが入る溝もシールホルダ9の径方向外側端面に形成されている。本出願のクレーム5及び12における外輪部材の溝は、外輪部材の軸方向外側端面に形成されており、引例2とは異なる。

FIG.17

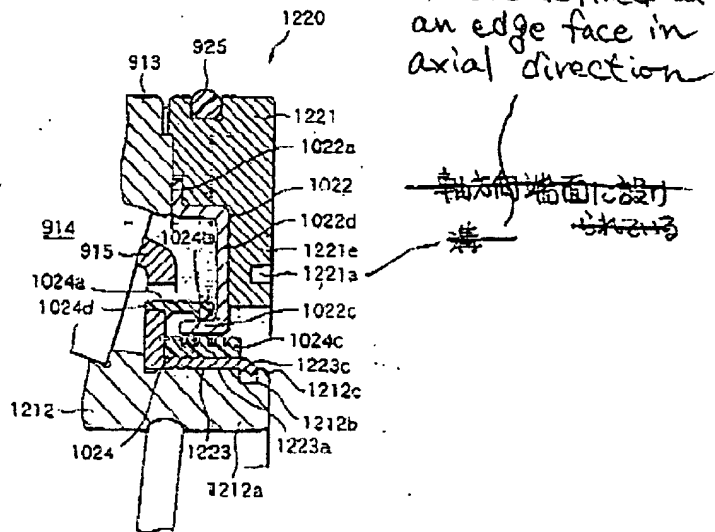


FIG.14B

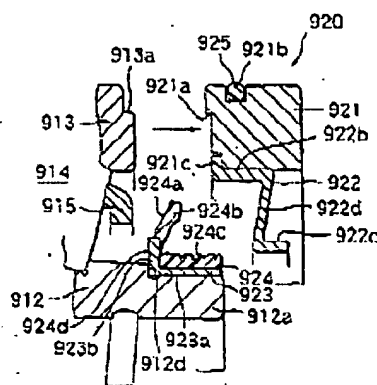
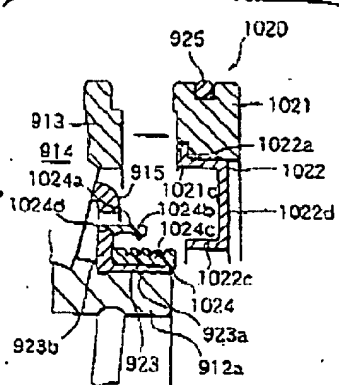


FIG.15B



分割可能な
密封装置

Dividable
sealing
apparatus

$\frac{5}{8}$

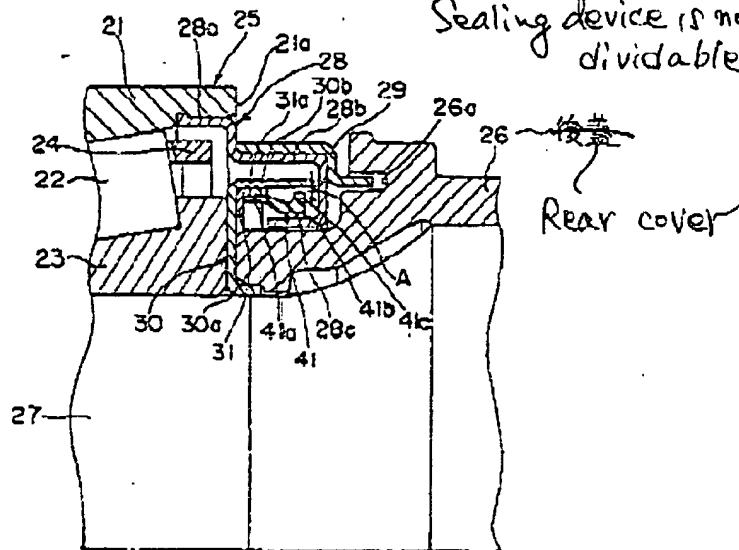
Reference 1 (260)

~~31.12.11~~

Fig. 1

~~一[圖]一 密封裝置及分割不可能~~

Sealing device is not dividable.



Reference 2 (1361)

~~31342~~

Fig. 2

~~【图2】~~

軸受徑方向端面

Edge in the radial direction of the bearing

